

Chat-UniVi: Unified Visual Representation Empowers Large Language Models with Image and Video Understanding

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Abstract

Large language models have demonstrated impressive universal capabilities across a wide range of open-ended tasks and have extended their utility to encompass multi-modal conversations. However, existing methods encounter challenges in effectively handling both image and video understanding, particularly with limited visual tokens. In this work, we introduce Chat-UniVi, a Unified Vision-language model capable of comprehending and engaging in conversations involving images and videos through a unified visual representation. Specifically, we employ a set of dynamic visual tokens to uniformly represent images and videos. This representation framework empowers the model to efficiently utilize a limited number of visual tokens to simultaneously capture the spatial details necessary for images and the comprehensive temporal relationship required for videos. Moreover, we leverage a multi-scale representation, enabling the model to perceive both high-level semantic concepts and low-level visual details. Notably, Chat-UniVi is trained on a mixed dataset containing both images and videos, allowing direct application to tasks involving both mediums without requiring any modifications. Extensive experimental results demonstrate that Chat-UniVi consistently outperforms even existing methods exclusively designed for either images or videos. Code is available at <https://github.com/PKu-YuanGroup/Chat-UniVi>.